SERIAL No. 3221

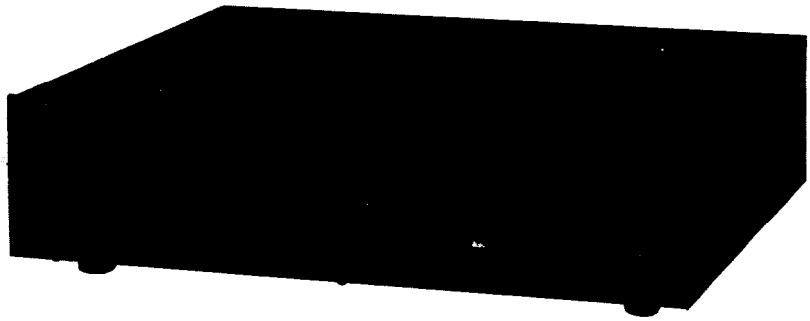
TX-RV47

ONKYO SERVICE MANUAL

COMPUTER CONTROLLED

AV TUNER AMPLIFIER

MODEL TX-RV47



SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

AMPLIFIER SECTION

Power Output:	55 watts per channel, min. RMS, at 8 ohms, both channels driven, from 20Hz to 20kHz, with no more than 0.08% THD.
Total Harmonic Distortion:	0.08% at 1W 0.08% at rated power
IM Distortion:	0.08% at 1W 0.08% at rated power
Damping Factor:	35 at 8 ohms
Frequency Response:	20 – 30,000 Hz ± 1dB
RIAA Deviation:	20 – 20,000 Hz ± 0.8dB
Sensitivity and Impedance:	Phone: 2.5mV/50 kohms Tape Play: 150mV/50 kohms Tape Rec: 150mV/3.5 kohms (phono)
Phono Overload:	150mV RMS at 1kHz, 0.08% THD
Signal-to-Noise Ratio:	Phono: 83dB (at 10mV input, A weighted) 73dB (IHF A202) CD/Tape: 93dB (A weighted) 78dB (IHF A-202)
Tone Controls:	Bass: ±8.5dB at 100Hz Treble: ±8.5dB at 10kHz
Loudness(–30dB):	+7dB at 70Hz, +5dB at 10kHz
Muting:	–20dB

TUNER SECTION

FM:

Tuning Range:	87.9 – 107.9 MHz (200kHz steps)
Usable Sensitivity:	Mono: 11.2dBf, 2.0μV Stereo: 17.2dBf, 4.0μV
50dB Quieting Sensitivity:	Mono: 17.2dBf, 4.0μV Stereo: 37.2dBf, 40μV
Capture Ratio:	1.5dB
Image Rejection Ratio:	40dB
IF Rejection Radio:	90dB
Signal-to-Noise Ratio:	Mono: 71dB Stereo: 66dB
Alternate Channel Attenuation:	55dB
AM Suppression Ratio:	50dB
Harmonic Distortion:	Mono: 0.15% Stereo: 0.3%
Frequency Response:	30 – 15,000Hz ± 1.5dB
Stereo Separation:	40dB at 1kHz 30dB at 100 – 10,000Hz
Muting Level:	17.2dBf, 4.0μV
Stereo Threshold:	17.2dBf, 4.0μV

AM:

Tuning Range:	530 – 1620kHz (10kHz steps)
Usable Sensitivity:	30μV
Image Rejection Ratio:	40dB
IF Rejection Ratio:	40dB
Signal-to-Noise Ratio:	40dB
Harmonic Distortion:	0.7%

GENERAL

Power Supply:	AC120V, 60Hz
Semiconductors:	FETs: 7 TR: 51 ICs: 32 Diodes: 61 LEDs: 41
Dimensions (W x H x D):	435 x 120 x 392mm 17-1/8" x 4-11/16" x 15-7/16"
Weight:	9.5 kg., 20.9 lbs.

RC-47 Remote Control Unit

Transmitter:	Infrared
Signal range:	Approx. 5 meters
Power supply:	Two "AA" batteries (1.5V x 2)
Dimensions:	55(W)x19(H)x167(D)mm
Weight:	120 grams (including batteries)

Specifications and features are subject to change without notice

SERVICE PROCEDURES

1. Replacing the fuse

For continued protection against fire hazard, replace only with same type and same rating fuse.

Circuit No.	Part No.	Description
F921	252049	4A (ST-6), Primary fuse

2. Safety-check out

After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Connect the insulating-resistance tester between the plug of power supply cable and terminal GND on the back panel.

Specification: 3.3MΩ ±10% at 500V

3. Memory Preservation

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory, the power switch must be turned on and off a few times each month to keep the back-up system operable. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and the location and placement of the unit. On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

4. Remote Control Operator Batteries

The remote control operator is powered by two batteries. Before using this unit for the first time, insert the two batteries (included). The remote control operator has no on/off switch. Average battery life is one year. This period may be shorter depending on the frequency of use and environment (temperature and humidity) in which the remote control operator is used. If the remote control does not operated even through front panel controls function normally, the batteries should be replaced. Used only batteries listed in the following chart.

Type	Voltage	ANSI	NEDA	Eveready	Mallory
Manganese	1.5V	AA	15P 15P 15 15D	815 915 1015 1215	M15P M15F M150F M1504

Ray-O-Vac	Bright Star	Burgess	RCA	Sears	IEC
710 7AA 15 5AA	59P 59 0199	920 910 930	VS734 VS034A VS334	8950	R6

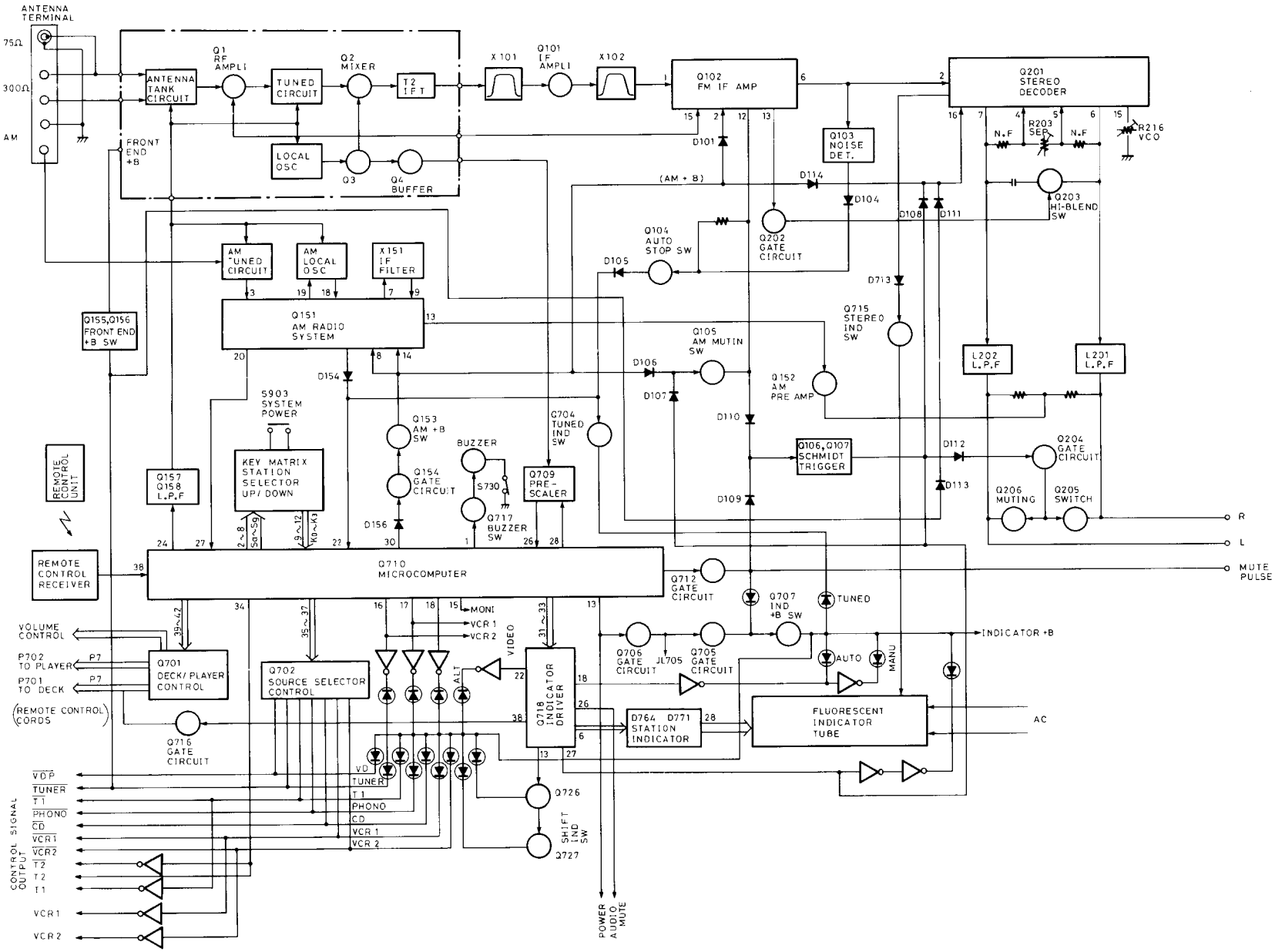
5. Replacing the lamp

This unit uses the lamp listed below.

Circuit no.	Part no.	Description
PL701	210064A	PL 6.3V, 250mA, Dial plate illumination

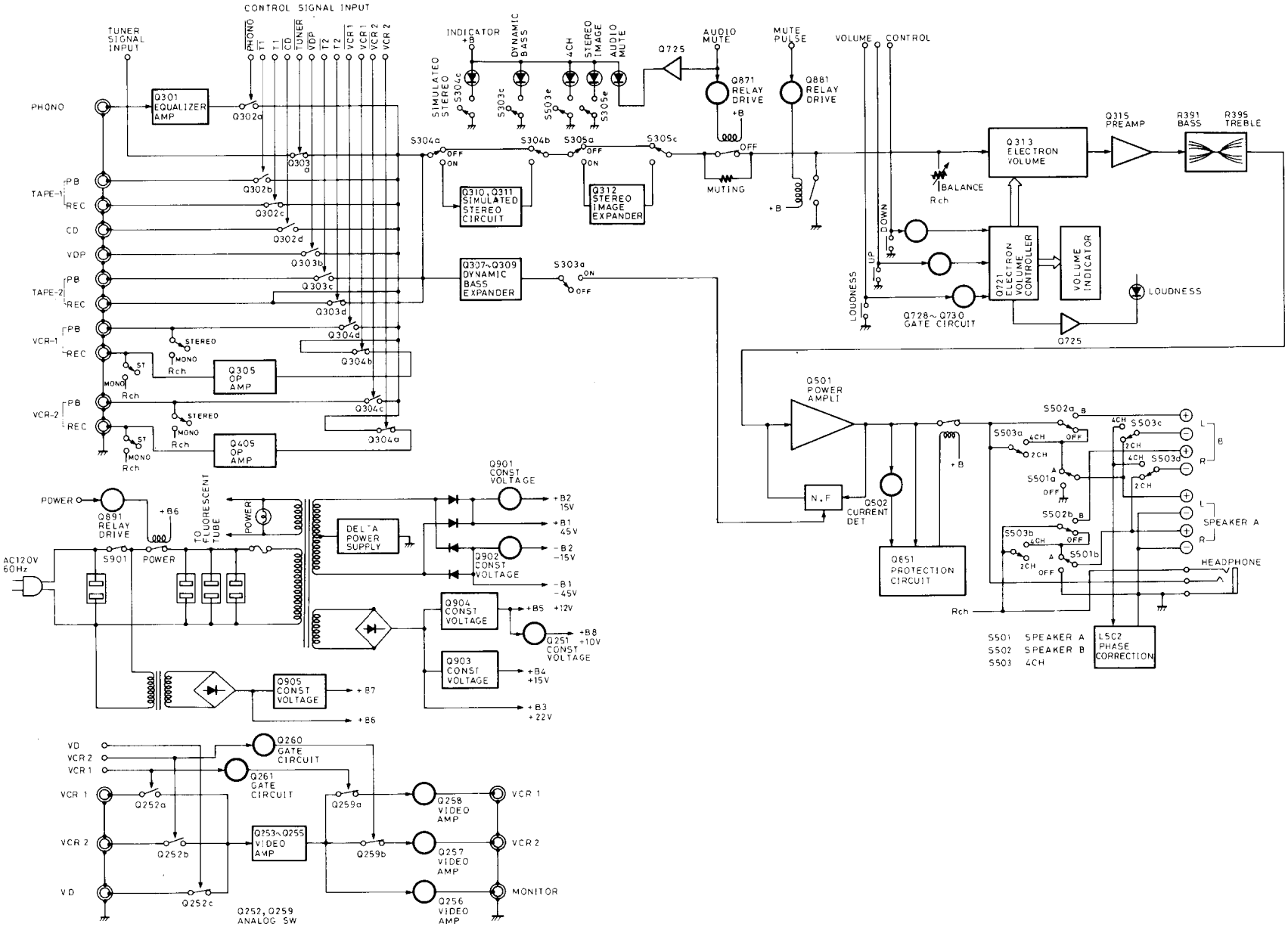
BLOCK DIAGRAM

– Tuner Section –



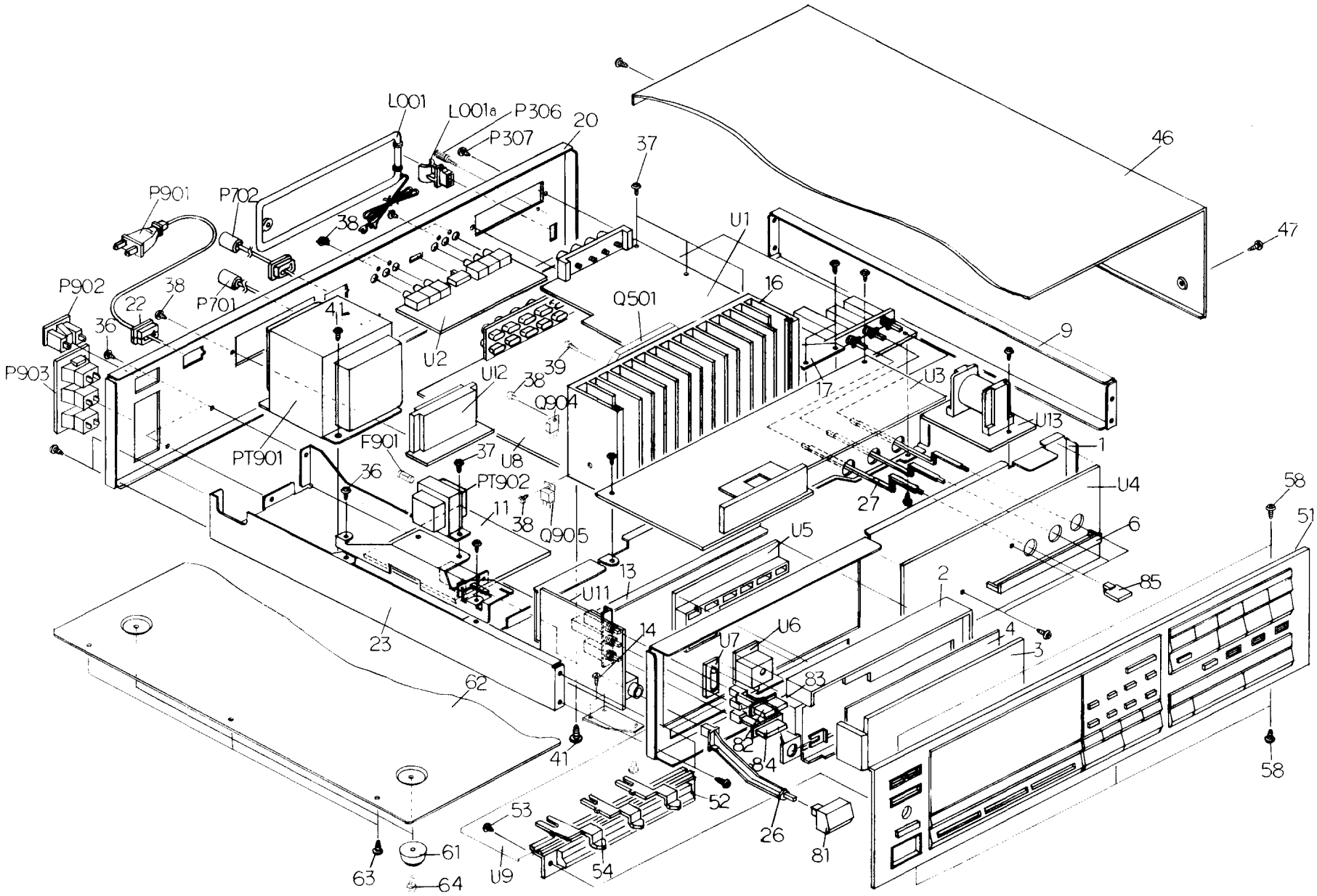
BLOCK DIAGRAM

– Amplifier section –



TX-RV47

EXPLODED VIEW



PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
1	27110264A	Front bracket
2	27190414	Holder
3	28130232A	Dial plate
4	28133153	Back plate
6	27262385A	Plate B
9	27115196	Side bracket R
11	27141036A	Bracket, power transformer
13	27130412	Bracket, center
14	27141037	Bracket, pc board
16	27160180	Radiator
17	27141038A	Bracker, radiator
20	27120781	Back panel
22	27300750 ⚠	Strainrelief
23	27130411A	Bracket, power transformer
26	27273036	Joint
27	27273046	Joint, push
28	27141048	Bracket Z
35	838430068	3TTB+6B (BC), Tapping screw
36	834430068	3TTS+6B (BC), Tapping screw
37	831130088	3TTW+8B, Tapping screw
38	834430108	3TTS+10B (BC), Tapping screw
39	834430168	3TTS+16B (BC), Tapping screw
41	830440089	4TTC+8C (BC), Tapping screw
43	82143006	3P+6FN(BC), Pan head screw
46	28184303	Top cover
47	834430068	3TTS+6B (BC), Tapping screw
51	~~18588121~~	Front panel ass'y 28·10
52	28400249	Rail, slide
53	28322332	3TTP+8P (BC), Tapping screw
54	2832232	Knob, slide
58	838430068	3TTB+6B (BC), Tapping screw
61	27170214A	Bottom board
62	27175009A	Leg
63	834430068	3TTS+6B (BC), Tapping screw
64	831430088	3TTW+8B (BC), Tapping screw
81	28321905B	Knob, power
82	28322304	Knob, speaker A
83	28322305	Knob, speaker B
84	28322306	Knob, channel 4

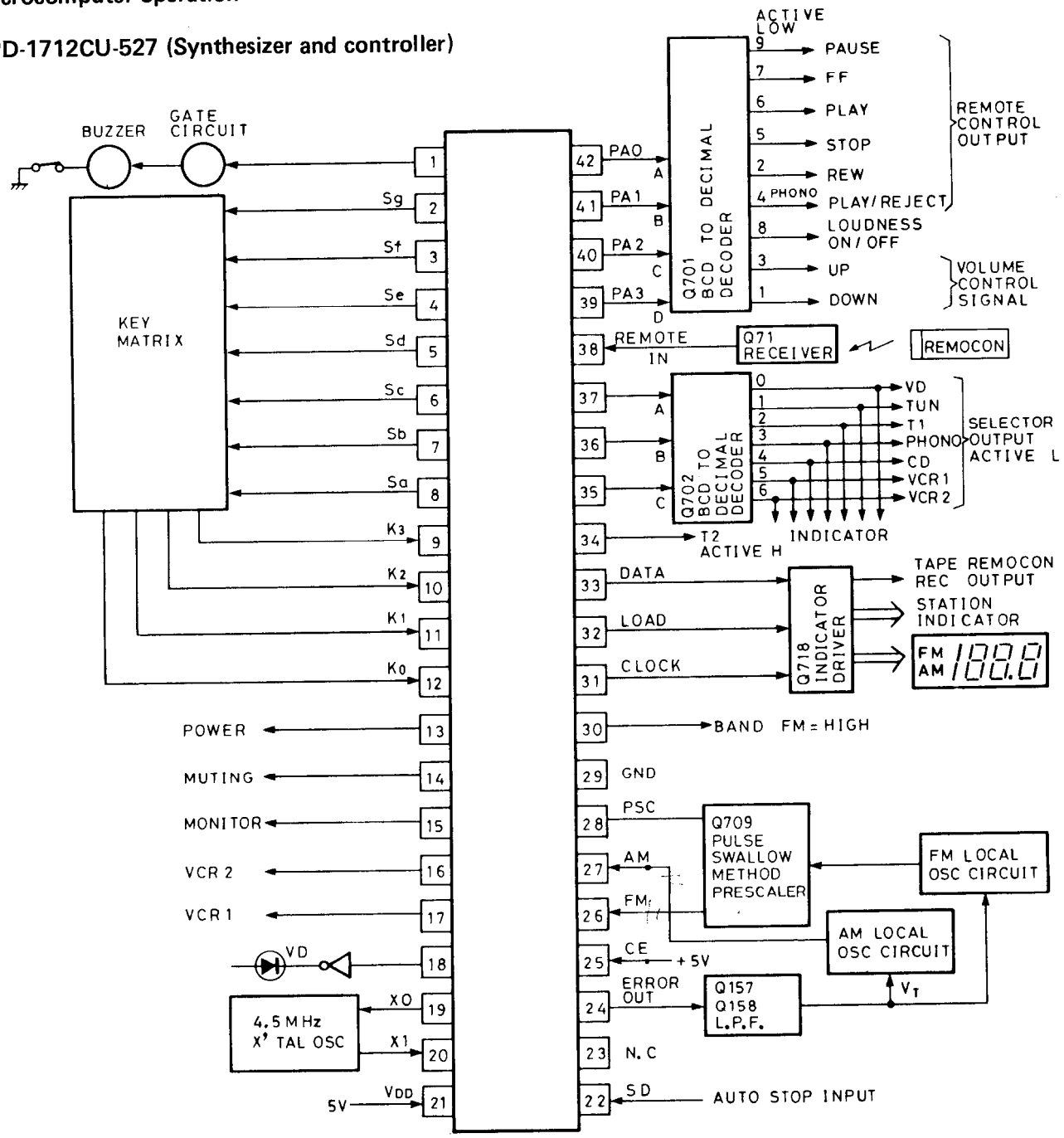
NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

REF. NO.	PART NO.	DESCRIPTION
85	28322335	Knob, push
F901	252049 ⚠	4A (ST-6), Fuse
L001	232085	NMA-3034, AM loop antenna
L001a	27190105	Holder, antenna
P306	25060044	3x14, Terminal, ground
P701	2010122	Cord, control, remote, phono
P702	2010123	Cord, control, remote, cassette
P901	253123	AS-UC-6#18, Power supply cord
P902	25050118	NSCT-2P-26T, AC outlet
P903	25050216	NSCT-6P44, AC outlet
PT901	2300039	NPT-901D, Power transformer
PT902	2300040	NPT-902D, Power transformer
Q501	222043	STK-4181V, Power amplifier IC
Q904	222780122	78M12, Constant voltage IC
Q905	2201404 or 2201405	2SD1406 (Y) or 2SD1406 (GR), Transistor
U1	18588571	NARF-2471-1, Tuner circuit pc board ass'y
U2	18588572	NASEL-2472-1, Video selector circuit pc board ass'y
U3	18588573	NADG-2473-1, Digital circuit pc board ass'y
U4	18588574	NADIS-2474-1, Display circuit pc board ass'y
U5	18588575	NADIS-2475-1, Display circuit pc board ass'y
U6	18588576	NADG-2476-1, Remote control receiver circuit pc board ass'y
U7	18588577	NAPL-2477-1, Dial illumination pc board ass'y
U8	18588578	NAAF-2478-1, Pre./Main amplifier and power supply circuit pc board ass'y
U9	18588579	NATC-2479-1, Volume and tone control circuit pc board ass'y
U10	18588580	NAPS-2480-1, Power supply circuit pc board ass'y
U11	18588581	NASW-2481-1, Speaker switch pc board ass'y
U12	18588582	NATRM-2482, Speaker terminal pc board ass'y
U13	18588583	NAMR-2483-1, Matrix circuit pc board ass'y

CIRCUIT DESCRIPTION AND IC BLOCK DIAGRAM

Microcomputer operation

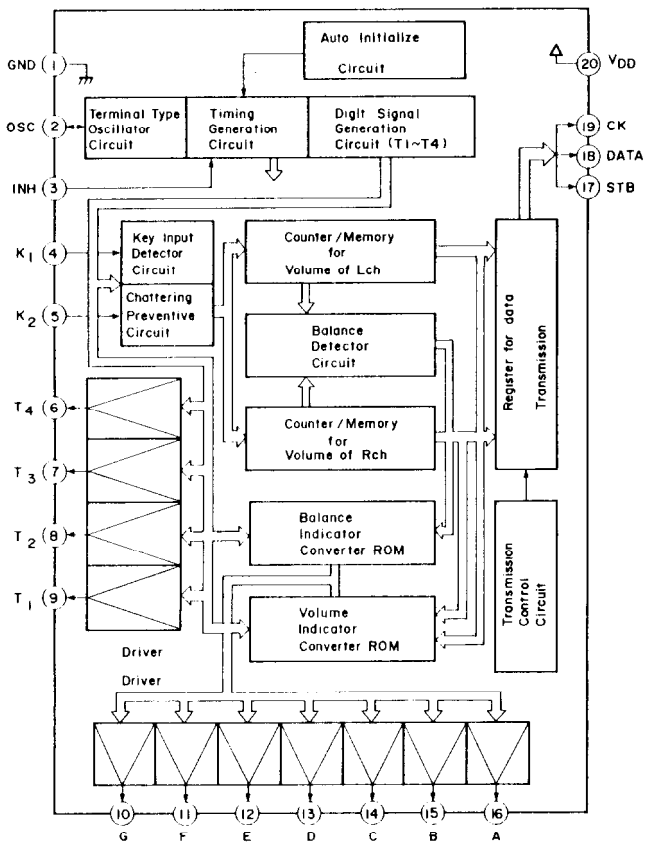
μPD-1712CU-527 (Synthesizer and controller)



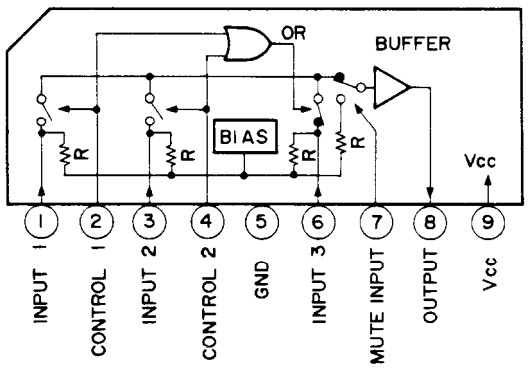
Pin No.	Symbol	Description
1	CPG	Clock pulse output for buzzer when pressed the operation keies and auto-tuning.
2 3 4 5 6 7 8	Sg Sf Se Sd Sc Sb Sa	Key return signal source output terminals.

<table>
<tr><th>Pin No.</th><th>Symbol</th><th>Description</th></tr>
<tr><td>9
10
11
12</td><td>K3
K2
K1
K0</td><td>Key return signal input terminals.</td></tr>
<tr><td>13</td><td>POWER</td><td>System power control output. Active high.</td></tr>
<tr><td>14</td><td>MUTE</td><td>Goes to the high level during muting control signal output. Active high.</td></tr>
<tr><td>15</td><td>MONITOR</td><td>Monitor output terminal for control of video. Active high.</td></tr>
<tr><td>16</td><td>VCR2</td><td>VCR2 output terminal for control of video. Active high.</td></tr>
<tr><td>17</td><td>VCR1</td><td>VCR1 output terminal for control of video. Active high.</td></tr>
<tr><td>18</td><td>VD</td><td>Output terminal for indicator VD. Active high.</td></tr>
<tr><td>19
20</td><td>X0
X1</td><td>Connect to the 4.5MHz crystal oscillator.</td></tr>
<tr><td>21</td><td>V_{DD}</td><td>Device power terminal; supplies 5V during normal operation and 3V from the super capacitor C703 for memory preservation.</td></tr>
<tr><td>22</td><td>SD</td><td>Station detector input terminal. When this terminal goes to the high level, auto search tuning is stopped.</td></tr>
<tr><td>23
24</td><td>E02
E01</td><td>Charge pump output of the phase detector which constitutes the PLL. High level is output when the divided local oscillator frequency is high than the reference frequency.
In the opposite case, low level is output. Floating occurs when the frequencies matched.
The output is applied to the variable capacitor diode in the local oscillator circuit of AM/FM through low pass filter Q157 and Q158. The output from both terminals is the same, but only E01 is used.</td></tr>
<tr><td>25</td><td>CE</td><td>Chip enable input. Device selection signal terminal. High level ... Normal operation
Low level ... Memory preservation.</td></tr>
<tr><td>26</td><td>FM</td><td>Local oscillator frequency input terminal is divided by prescaler Q709.</td></tr>
<tr><td>27</td><td>AM</td><td>Local oscillator frequency input terminal.</td></tr>
<tr><td>28</td><td>PSC</td><td>Output terminal to control the division ratio of the prescaler Q709.</td></tr>
<tr><td>29</td><td>GND</td><td>Ground terminal</td></tr>
<tr><td>30</td><td>FM/AM</td><td>FM/AM band selector output. FM at the high level and AM at the low level.</td></tr>
<tr><td>31</td><td>CK</td><td>Clock output for indicator driver IC Q718.</td></tr>
<tr><td>32</td><td>LOAD</td><td>Load output for indicator driver IC Q718.</td></tr>
<tr><td>33</td><td>DATA</td><td>Data output for indicator driver IC Q718.</td></tr>
<tr><td>34</td><td>TAPE 2</td><td>TAPE 2 control output terminal. Active high.</td></tr>
<tr><td>35
36
37</td><td>PC2 (C)
PC1 (B)
PC0 (A)</td><td>BCD code output for source selector.
<table>
<tr><th></th><th>VD</th><th>TUNER</th><th>TAPE 1</th><th>PHONO</th><th>CD</th><th>VCR 1</th><th>VCR2</th></tr>
<tr><td>C</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>B</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td></tr>
<tr><td>A</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td></tr>
</table>
Active low.</td></tr>
<tr><td>38</td><td>INT</td><td>Remote control input.</td></tr>
<tr><td>39
40
41
42</td><td>PA3 (D)
PA2 (C)
PA1 (B)
PA0 (A)</td><td>BCD code outputs for the electron volume and remote control signal for tape deck and turntable.
<table>
<tr><th></th><th>DOWN</th><th>REW</th><th>UP</th><th>PLAY/ REJ</th><th>STOP</th><th>PLAY</th><th>FF</th><th>LOUD</th><th>PAUSE</th></tr>
<tr><td>D</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td></tr>
<tr><td>C</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr>
<tr><td>B</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td></tr>
<tr><td>A</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td></tr>
</table>
Active low.</td></tr>
</table>

TC9185P (Electron Volume Controller)



TA7348P (Three Input Switch)

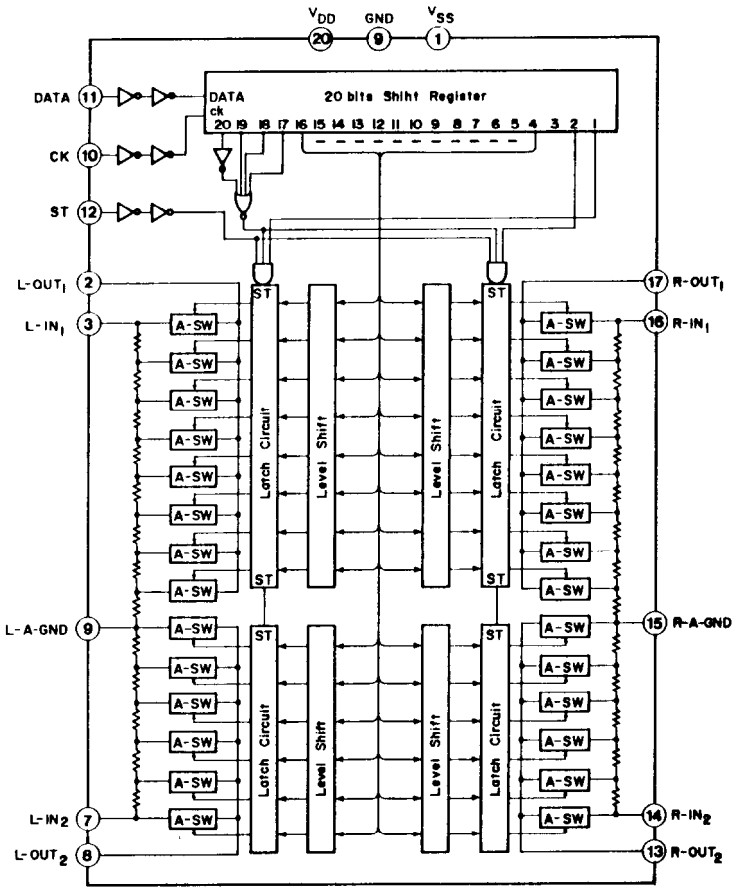


CONTROL 1 VCR 1	CONTROL 2 VCR 2	MUTE IN MONITOR	OUTPUT	
H	L	L	INPUT 1	VCR1
L	H	L	INPUT 2	VCR2
L	L	L	INPUT 3	VD
H	H	L	UNDEFINED	
*	*	H	NONE	

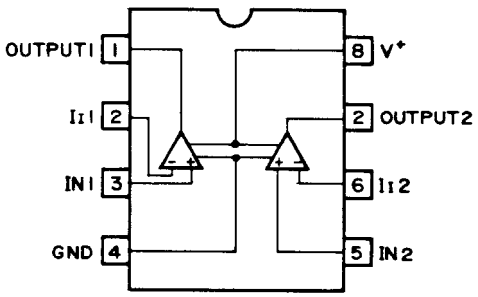
*: Don't care

Pin No.	Symbol	Description
1 20	GND V_{DD}	Ground terminal Power supply terminal
2	OSC	Terminal for oscillator: The oscillator is composed of an external circuit of C721 and R803. This generates the clock (100kHz) required for the system.
3	INH	Inhibit terminal: When INH = "H", there is normal operation, and when INH = "L", operation is inhibited. With low current consumption, volume/balance data are maintained. When INH goes from "L" to "H", the built in power source voltage detection circuit operates, and when $V_{DD} \leqq V_{INT}$, the volume/balance data are initialized.
4 5	K1 K2	Key input terminals: K1 and K2 make up the T1 to T4 digital output and matrix, and a maximum of 8 switches can be connected.
6 7 8 9	T4 T3 T2 T1	Digital drive output terminals: These are the common terminals for the LED display. They are also used for the key matrix scan signal.
10 11 12 13 14 15 16	G F E D C B A	Segment drive output terminals: These are the terminals for the segment drive of the display LED. T1 and T2 serve the volume display 14 point matrix, and T3 and T4 serve the balance display 13 point matric.
17 18 19	STB DATA CK	Serial control output terminals: These terminals provide for the transmission of the data in the electronic volume IC.

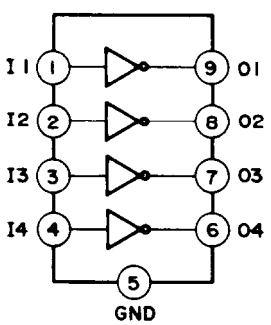
TC9177P (Electron Volume)



μPC393C (Comparator)

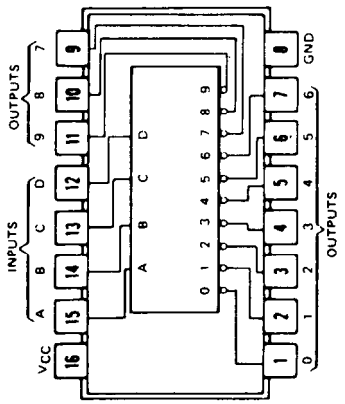


TD62551S (Single Driver)



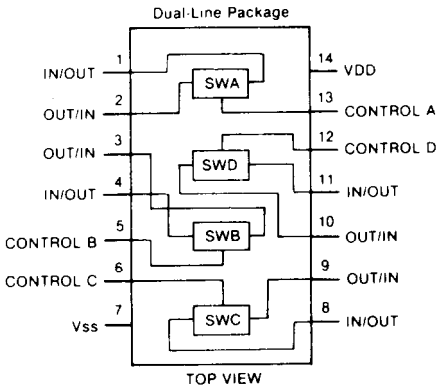
Pin No.	Symbol	Description
2, 3 19, 18	L-Loudness 1, 2 R-Loudness 1, 2	Terminals for loudness. Terminals for loudness: When the loudness data is input, these terminals become the −20dB tap terminals. By means of the connection of the high and low boost circuit to these terminals, the loudness control circuit can be brought into operation.
4 17	L-OUT1 R-OUT1	10dB step attenuator output: The signal applied to the IN terminals is attentuated in 10dB steps from 0 to 70dB in 8 stages.
5 16	L-IN1 R-IN1	10dB attenuator input
6, 15	A-GND	AC ground terminal
7 14	L-IN2 R-IN2	2dB attenuator
8 13	L-OUT2 R-OUT2	2dB attentuator output: The signal applied to the IN terminals is attentuated in 2dB steps from 0 to 8dB in 5 stages.
11	DATA	Attentuation level and channel selection data input: Input is accomplished with the CK signal composed of 20 bits.
10	CK	Clock input: The clock input is for the purpose of feeding in the data terminal data.
12	ST	Strobe input: The attentuation level and channel selection data fed in from the DATA and CK terminals are lapped by means of an "H" level at these terminals. When an "H" level is not impressed at these terminals, the previous data remains as is.
20 9 1	V_{DD} GND V_{SS}	Power supply terminal Ground terminal Power supply terminal

74LS145 (BCD to Decimal Decoder/Driver)

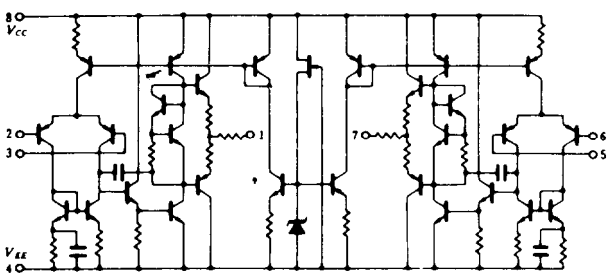


NO.	INPUTS				OUTPUTS									
	D	C	B	A	0	1	2	3	4	5	6	7	8	9
0	L	L	L	L	L	H	H	H	H	H	H	H	H	H
1	L	L	L	H	H	L	H	H	H	H	H	H	H	H
2	L	L	H	L	H	H	L	H	H	H	H	H	H	H
3	L	L	H	H	H	H	H	L	H	H	H	H	H	H
4	L	H	L	L	H	H	H	H	L	H	H	H	H	H
5	L	H	L	H	H	H	H	H	H	L	H	H	H	H
6	L	H	H	L	H	H	H	H	H	H	L	H	H	H
7	L	H	H	H	H	H	H	H	H	H	H	L	H	H
8	H	L	L	L	H	H	H	H	H	H	H	H	L	H
9	H	L	L	H	H	H	H	H	H	H	H	H	H	L
INVALID	H	L	H	L	H	H	H	H	H	H	H	H	H	H
	H	L	H	H	H	H	H	H	H	H	H	H	H	H
	H	H	L	L	H	H	H	H	H	H	H	H	H	H
	H	H	L	H	H	H	H	H	H	H	H	H	H	H
	H	H	H	L	H	H	H	H	H	H	H	H	H	H
	H	H	H	H	H	H	H	H	H	H	H	H	H	H

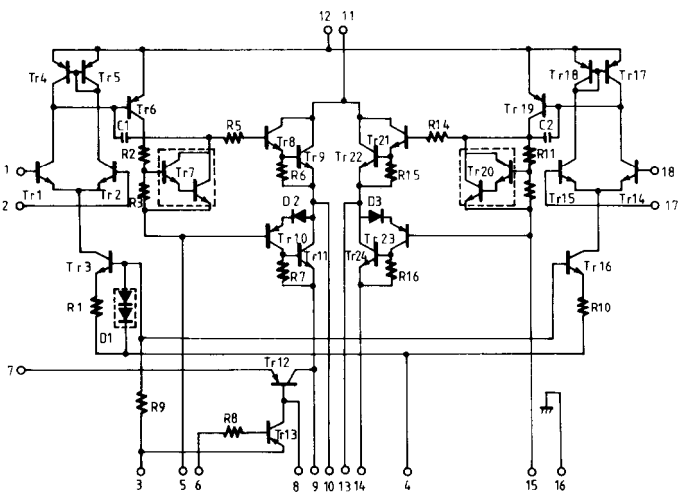
4066B (Analog Switch)



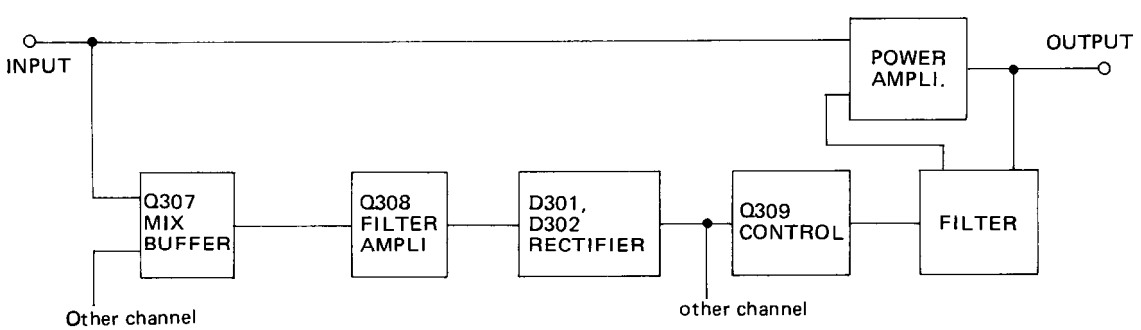
NJM4558/4559 (Operational Amplifier)



STK4181V (Power Amplifier)



Dynamic Bass Expander Circuit

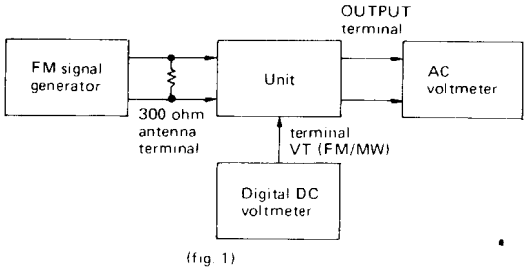


In earlier super base systems, only the frequencies about 70Hz were boosted by about 4dB expand the playback frequency response to enable playback of the super low region. However, when there was no input signal, the above frequency response resulted in deterioration in the S/N ration in the 70Hz region. This problem had been overcome by the dynamic bass expander where the 70Hz boosted level is varied according to the input signal level. That is, the frequency response remains flat when no input signalis applied, but is boosted at the 70Hz region to the specified level when the input signal exceeds a certain level. The left and right channel input signals from the INPUT terminals are mixed by Q307 and pass through the filter amplifer. The signal is rectified by D306 and D302, and the resultant DC component control signal is applied to the gate of Q309. When the input signal is at a adequate level, Q308 is turned on and the super base circuit of power amplifier is controlled by the input signal.

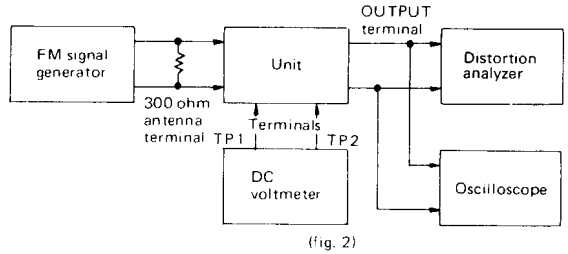
ADJUSTMENT PROCEDURES

FM section

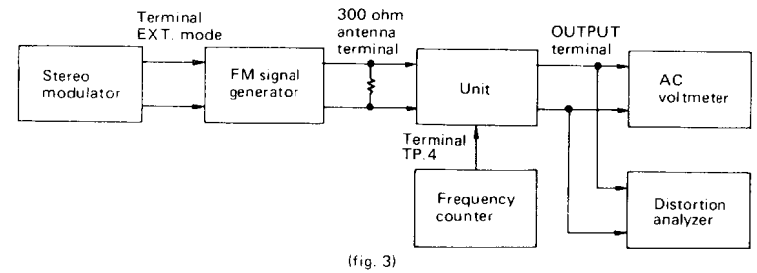
Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Turning dial setting	Output indicator	Adjustment	Adjust for	Remarks
FM RF		Fig. 1	–	–	88.1 MHz	Digital DC voltmeter	LO	1.4V	Usually not necessary to adjust.
FM IF	1	Fig. 2	99.1 MHz 1 kHz, 75 kHz devi. 65 dBf (60dB)	–	99.1 MHz	DC voltmeter	L102 Primary coil	0V	Muting switch: off Repeat the steps 1 and 2 until no further adjustment is necessary
	2	Fig. 2		–	99.1 MHz	Distortion analyzer	L102 Secondary coil	Minimum	
VCO		Fig. 3	99.1 MHz 1 kHz, 75 kHz devi. 65 dBf (60 dB)	–	99.1 MHz	Frequency counter	R216	19 kHz ± 10 Hz	Muting switch: on
Distortion		Fig. 3	99.1 MHz 65 dBf (60 dB) Ext. modulation	L + R 1 kHz	99.1 MHz	Distortion analyzer	IF on front end	Minimum	
Separation	1	Fig. 3	99.1 MHz 65 dBf (60 dB) Ext. modulation	L ch. 1 kHz	99.1 MHz	R ch. AC voltmeter	R203	Minimum	Maximum and same separation
	2			R ch. 1 kHz		L ch. AC voltmeter		Minimum	
Muting level	1	Fig. 2	99.1 MHz 17.2 dBf (12 dB) 1 kHz, 75 kHz devi.	–	99.1 MHz	Oscilloscope	R116	Signal output	Multing switch: on
	2		99.1 MHz 16.2 dBf (11 dB) 1 kHz, 75 kHz devi.					No output	



(fig. 1)



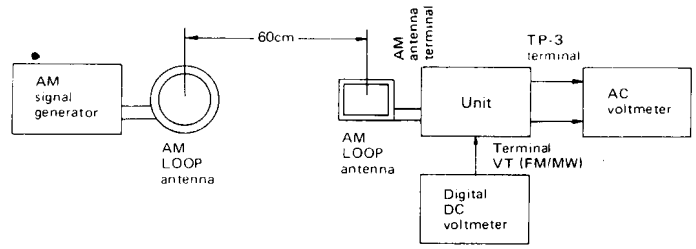
(fig. 2)

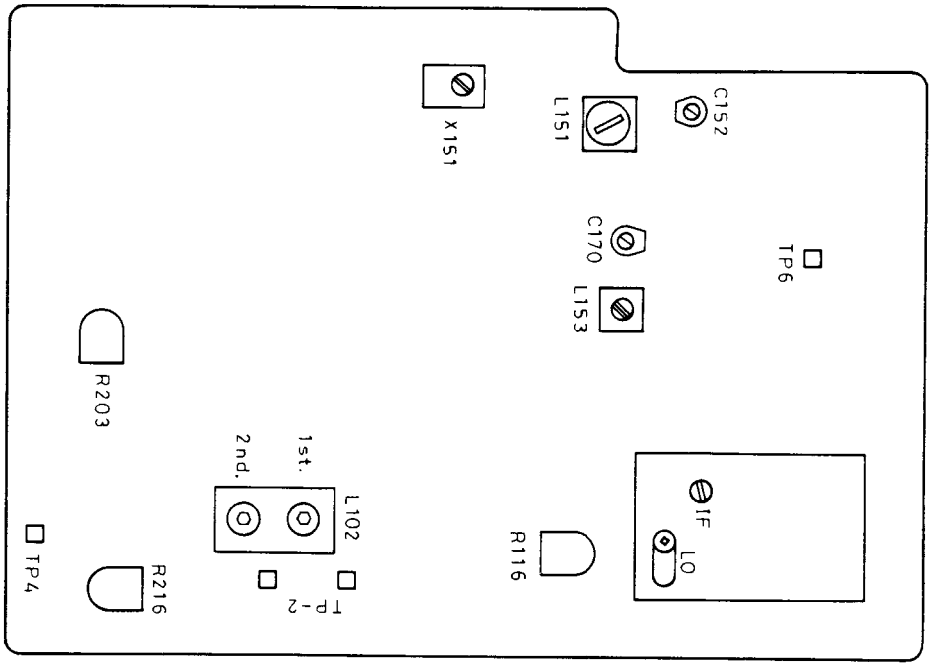


(fig. 3)

AM section

Step	AM SG output	Tuned frequency	Output indicator	Adjustment point	Adjust for	Remarks
1		530 kHz	Digital DC voltmeter	L153	1.2V	Repeat the steps 1 and 2 until no further adjustment is necessary.
2		1620 kHz	Digital DC voltmeter	C170	9.5V	
3	600 kHz 400 Hz 30% mod.	600 kHz	AC voltmeter	L151	Maximum	Repeat the steps 3 and 4 until no further adjustment is necessary.
4	1400 kHz 400Hz 30% mod.	1400 kHz	AC voltmeter	C152	Maximum	
5	1000 kHz 400 Hz 30% mod.	1000 kHz	AC voltmeter	X151	Maximum	





TUNER CIRCUIT PC BOARD (NARF-2471-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Front End	
	240061	FE349U14
	ICs	
Q102	222540	HA-11225
Q151	222701	LA1245
Q201	222678	μPC1161C3
	Transistors	
Q101	2211722 or	2SC1923 (R) or
	2211723	2SC1923 (O)
Q103-Q107	2211255,	2SC1815 (GR),
Q153-Q156	2210746 or	2SC945A (P) or
	2212485	JC501 (Q)
Q152, Q202	2211256	2SC1815 (BL)
Q157	2212294 or	2SK108 (D) or
	2211293	2SK68 (M)
Q158	2211255	2SC1815 (GR)
Q203	2211945 or	2SK246 (GR) or
	2212304	2SK381 (D)
Q204	2211454 or	2SA1015 (Y) or
	2212494	JA101 (P)
Q205, Q206	2211705 or	2SD655 (E) or
	2211706	2SD655 (F)
	Diodes	
D101-D114	223150,	US1040,
D154, D156	223145 or	1S2076TD or
	223124	1S2473
D151, D152	223140	KV1236
D153	4000068	VD1222
	Coils	
L101	233105 or	NCCH1005 or
	233024	NCCH1501
L103	233031	NMC-9-1
L151	232113	NMA3049
L153	232110	NMO4027
L201, L202	233291	NMC-5039
	Transformer	
L102	233274	NFIF-6041
	Ceramic Filters	
X101, X102	3010006	SFE10.7MA8 (RED)
X151	3010075	SFL450B3
X152	3010076	BFU450C

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C101	352780339	3.3μF, 50V, Elect.
C106, C109	352780109	1μF, 50v, Elect.
C110	352741009	10μF, 16V, Elect.
C116, C119	352784799	0.47μF, 50V, Elect.
C121	352780229	2.2μF, 50V, Elect.
C122	352741009	10μF, 16V, Elect.
C123	352780109	1μF, 50V, Elect.
C124	352721019	100μF, 6.3V, Elect.
C125	352741019	100μF, 16V, Elect.
C152, C170	3060010	NTC-20P09, Trimmer
C158	352741009	10μF, 16V, Elect.
C161	352744709	47μF, 16V, Elect.
C162	352780109	1μF, 50V, Elect.
C165	352750479	4.7μF, 25V, Elect.
C166	352741009	10μF, 16V, Elect.
C168	370135114	510pF±5%, 100V, APS
C173	352781099	0.1μF, 50V, Elect.
C174	352721019	100μF, 6.3V, Elect.
C175	352780339	3.3μF, 50V, Elect.
C177	395160227	2.2μF, 35V, Tantalum
C178	392884797	0.47μF, 50V, LL
C201	352750479	4.7μF, 25V, Elect.
C202	352744719	470μF, 16V, Elect.
C209, C210	352741009	10μF, 16V, Elect.
C212	352782299	0.22μF, 50V, Elect.
C213	352780109	1μF, 50V, Elect.
C124	352780339	3.3μF, 50V, Elect.
C215	370134714	470pF ±5%, 100V, APS
C216	352741009	10μF, 16V, Elect.
C219, C220	352780229	2.2μF, 50V, Elect.
	Resistors	
R116	5215045	N08HR10KBC, Semi-fixed
R203	5215048	N08HR200KBC, Semi-fixed
R216	5215044	N08HR5KBC, Semi-fixed
	Sockets	
	25050267	NSCT-3P95
	25050270	NSCT-6P98
	Terminal	
P001	25060091	NTM-5PDMN32, Antenna

VIDEO SELECTOR CIRCUIT PC BOARD (NASEL-2472-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q252	222927	TA7348P
Q259	222575 or 222840661	TC4066BP or 4066B
	Transistors	
Q251	2211705 or 2211706	2SD655 (E) or 2SD655 (F)
Q253	2211454	2SA1015 (Y)
Q254-Q258	2211255 or 2210746	2SC1815 (GR) or 2SC945A (P)
Q260, Q261	2211255, 2210746 or 2212485	2SC1815 (GR), 2SC945A (P) or JC501 (Q)
	Diode	
D251	2239592 or 2243212	RD10EB2 or MTZ10B
	Capacitors	
C251-C256	352741009	10μF, 16V, Elect.
C257-C259	352724719	470μF, 6.3V, Elect.
	Socket	
	25050268	NSCT-4P96
	Terminals	
P251, P252	25045178	NPJ-3PDBL68
	Switch	
S730	25065242	NSS-22104, Slide

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q701, Q702	222741451	74LS145
Q703, Q708	222930	TD62551S
Q709	222619	μPB553AC
Q710	222932	μPD1712CU-527
Q718	222770	μPD6320G
Q720	222930	TD62551S
	Transistors	
Q704-Q706	2211255,	2SC1815 (GR),
Q712	2210746 or	2SC945A (P) or
Q715-Q717	2212485	JC501 (Q)
Q707	2211705 or	2SD655 (E) or
	2211706	2SD655 (F)
Q731	2211256	2SC1815 (BL)
	Fluorescent indicator tube	
Q719	212023	FIP7F8S
	Diodes	
D701, D702	223150,	US1040,
D704-D707	223145 or	1S2076TD or
D713, D714	223124	1S2473
D718		
D703	2239452	RD5.1EB2
D715	2241291	RD3.3EB1
D719	223848	GP08B
	X'tal	
X701	3010052	XTL4.5M
	Buzzer	
X702	241048	PKM24-4A0

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C701	352784799	0.47μF, 50V, Elect.
C702	352742209	22μF, 16V, Elect.
C703	3020018	0.047F, 5V, Super
C707	352721019	100μF, 6.3V, Elect.
C708	352784799	0.47μF, 50V, Elect.
C710, C712	352723319	330μF, 6.3V, Elect.
C714	352741009	10μF, 16V, Elect.
C715	352780109	1μF, 50V, Elect.
C726	352742209	22μF, 16V, Elect.
	Resistors	
R721-R728	49163103408	10kΩx8, 1/10W, Network
R730-R733	49163103404	10kΩx4, 1/10W, Network
R736-R739	49163104404	100kΩx4, 1/10W, Network
	Sockets	
	25050267	NSCT-3P95
	25050268	NSCT-4P96
	25050270	NSCT-6P98
	25050273	NSCT-9P101
	Plugs	
	25055133	NPLG-3P-177
	25055137	NPLG-7P-121
	Bracket	
	27141039	Fluorescent tube

DISPLAY CIRCUIT PC BOARD (NADIS-2475-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	L. E. Ds	
D732	225142	SEL2913K
D733, D740	225137CG,	SEL2413ECG,
	225137DG or	SEL2413EDG or
	225137DY	SEL2413EDY
D734-D739	225142	SEL2913K
	Resistor	
R762-R769	49121221508	220Ωx8, 1/8W, Network
	Holder	
	27190413	LED 9

REMOTE CONTROL RECEIVER CIRCUIT PC BOARD (NADG-2476-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	241060	HRS-0091, Receiver unit
D731	225137CG,	SEL2413E-CG,
	225137DG or	SEL2413E-DG or
	225137DY	SEL2413E-DY, L. E. D.
	27190412	Holder, LED

DIAL PLATE ILLUMINATION PC BOARD (NAPL-2477-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
PL701	210064A	PL6.3V, 250mA, Lamp

PRINTED CIRCUIT BOARD-PARTS LIST

VOLUME AND TONE CONTROL CIRCUIT PC BOARD (NATC-2479-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q313	222928	TC9177P
Q314, Q414	222502	NJM4558DX
Q315, Q415	222534	NJM4559DX
	Capacitors	
C350, C450	352780229	2.2μF, 50V, Elect.
C353, C453	352780229	2.2μF, 50V, Elect.
C354, C454	352742209	22μF, 16V, Elect.
C355, C455	352780109	1μF, 50V, Elect.
C356, C357	352744709	47μF, 16V, Elect.
C361, C461	352780109	1μF, 50V, Elect.
C362, C462	352742209	22μF, 16V, Elect.
C367, C368	352780339	3.3μF, 50V, Elect.
	Resistors	
R381	6142048	N30LLC250KWT10Z
R391, R491	6142050	N30LGLC250KC10Z
R395, R495	6142050	N30LGLC250KC10Z

POWER SUPPLY CIRCUIT PC BOARD (NAPS-2480-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q891	2211256	2SC1815 (BL)
Q905	2201404 or	2SD1406 (Y) or
	2201405	2SD1406 (GR)
	Diodes	
D891	223145,	1S2076TD,
	223150 or	US1040 or
	223124	1S2473
D911	223890 or	W01RL or
	223862	WL01
D912	223896 or	1N4003F or
	223880	GP101N4003
D913	2239493	RD6.2EB3
	Capacitors	
C901, C902	3500065A	⚠ DE7150FZ103PAC400/125V, IS
C922, C924	352741019	100μF, 16V, Elect.
C923	352742229	2,200μF, 16V, Elect.
C925	352733319	330μF, 10V, Elect.
C926	352724719	470μF, 6.3V, Elect.
	Resistors	
R901	431523355	⚠ 3.3MΩ, 1/2W, Solid
R911	441520104	1Ω, 1/2W, Metal oxide film
R912	441623314	330Ω, 1W, Metal oxide film
R913	441620474	4.7Ω, 1W, Metal oxide film
	Switch	
S901	25035398	⚠ NPS-111-L362P
	Relay	
RL891	25065269	NRL-1P5A-DC12-36
	Fuseholders	
	250113	⚠ SN5051
	Fuse	
F901	252049	⚠ 4A (ST-6)

SPEAKER SWITCH PC BOARD (NASW-2481-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
R518, R618	441623914	390Ω, 1W, Metal oxide film resistor
S501-S503	25035498	NPS-222-162-L460, Push switch
S903	25035500	NPS-111-S462, Push switch
P502	25045187	HLJ-0541-01-010, Stereo headphone terminal

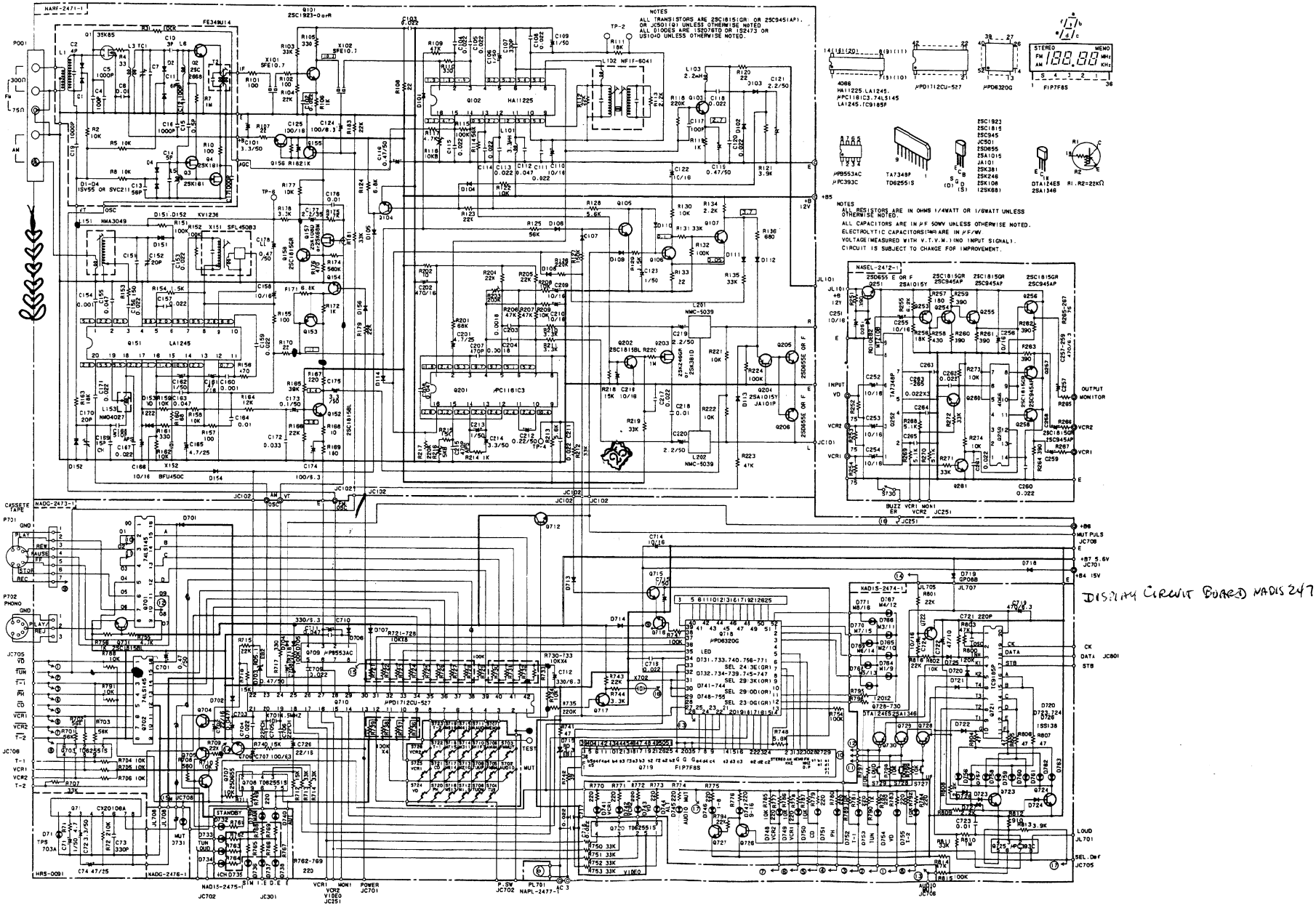
SPEAKER TERMINAL PC BOARD (NATRM-2482-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
P501	25060093	NTM-8PDML34, Speaker terminal

MATRIX CIRCUIT PC BOARD (NAMR-2483-1)

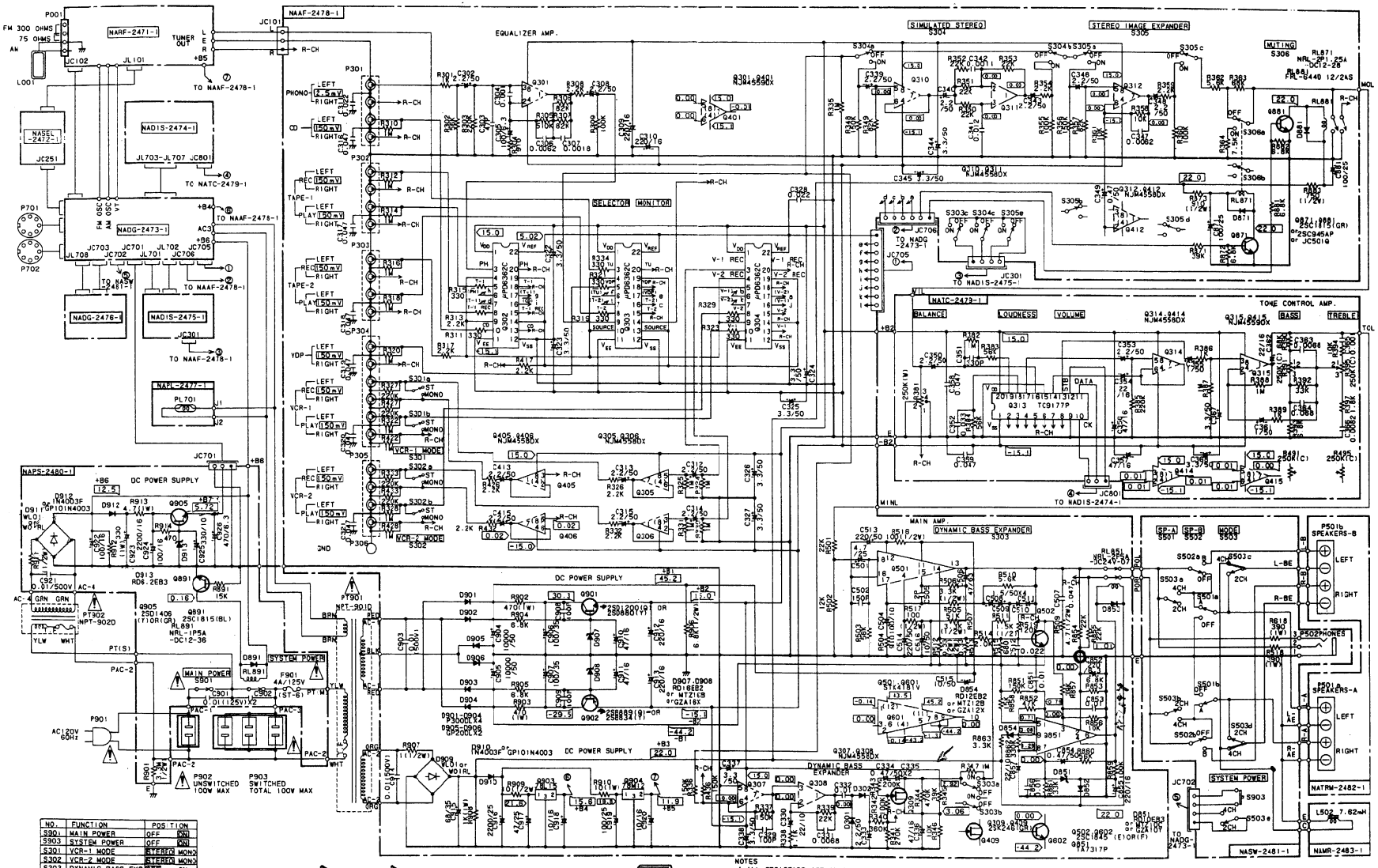
CIRCUIT NO.	PART NO.	DESCRIPTION
L502	CC204	CC-204, Choke coil

SCHEMATIC DIAGRAM



DISPLAY CIRCUIT BOARD NADIS2471

SCHEMATIC DIAGRAM



NO.	FUNCTION	POSITION	
S901	MAIN POWER	OFF	ON
S903	SYSTEM POWER	OFF	ON
S301	VCR-1 MODE	STEREO	MON2
S302	VCR-2 MODE	STEREO	MON2
S303	DYNAMIC BASS EXP	OFF	ON
S304	SIMULATED STEREO	OFF	ON
S305	STEREO IMAGE EXP	OFF	ON
S501	SPEAKER-A	OFF	A
S502	SPEAKER-B	OFF	B
S503	MODE	2CH	4CH
S306	MUTING	OFF	ON

78L15 1:INPUT 2:GND 3:OUTPUT
2SC1815 2SC1845
2SK246
2SD880 2SB834 2SD1406
78L15 1:INPUT 2:OUTPUT 3:GND
78M12
NJM4558DX NJM4559DX
TC9177P
μPD6362C
TA7317P
STK-4181V
2SD1200 2SB889

NOTES
1. ALL RESISTORS ARE IN OHMS 1/4 WATTS OR 1/8 WATTS UNLESS OTHERWISE NOTED.
2. ALL CAPACITORS ARE IN μF/50WV UNLESS OTHERWISE NOTED.
3. ELECTROLYTIC CAPACITORS ( ) ARE IN μF/WV.
4. VOLTAGE (MEASURED WITH V.T.V.M.) □V IS DC VOLTAGE. (NO INPUT SIGNAL)
5. CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.
6. THE COMPONENTS INDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
7. ALL DIODES ARE 1S2473 or 1S2076 or US1040 UNLESS NOTED.

ONKYO CORPORATION

PRINTED CIRCUIT BOARD-PARTS LIST

PRE./MAIN AMPLIFIER AND POWER SUPPLY CIRCUIT PC BOARD (NAAF-2478-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q301, Q401	222534	NJM4559DX
Q302-Q304	222926	μPD6362C
Q305-Q308	222502	NJM4558DX
Q405, Q406	222502	NJM4558DX
Q310, Q311	222502	NJM4558DX
Q312, Q412	222502	NJM4558DX
Q501, Q601	222043	STK4181V
Q851	222584	TA7317P
Q903	222780153	78L15
Q904	222780122	78M12
	Transistors	
Q309, Q409	2211945	2SK246 (GR)
Q502, Q602	2211733 or	2SC1845 (E) or
	2211732	2SC1845 (F)
Q871, Q881	2210746,	2SC945A (P),
	2212485 or	JC501 (Q) or
	2211255	2SC1815 (GR)
Q901	2201512 or	2SD1200 (Q) or
	2201074	2SD880 (Y)
Q902	2201502 or	2SB889 (Q) or
	2201244	2SB834 (Y)
	Diodes	
D301, D302	223145,	1S2076TD,
D852, D853	223150 or	US1040 or
D871, D881	223124	1S2473
D851	2239593,	RD10EB3,
	2243213 or	MTZ10C or
	2241072	GZA10Y
D854	2239632,	RD12EB2,
	2243232 or	MTZ12B or
	2241111	GZA12X
D901-D904	223897	P300DL
D905, D906	223845	GP20DL
D907, D908	2243262,	MTZ16B,
	2241171 or	GZA-16X or
	2239692	RD16EB2
D909	223890 or	W01RL or
	223862	WL01
D910	223896 or	1N4003F or
	223880	GP101N4003
	Capacitors	
C302, C402	352780229	2.2μF, 50V, Elect.
C305, C405	352721019	100μF, 6.3V, Elect.
C308, C408	352780229	2.2μF, 50V, Elect.
C309, C310	352742219	200μF, 16V, Elect.
C311	379122235	0.022μF, 50V, DEW
C312-C315	352780229	2.2μF, 50V, Elect.
C412-C415	352780229	2.2μF, 50V, Elect.
C322-C327	352780339	3.3μF, 50V, Elect.
C330	352732209	22μF, 10V, Elect.
C333	352780229	2.2μF, 50V, Elect.
C334, C335	352784799	0.47μF, 50V, Elect.
C434, C435	352784799	0.47μF, 50V, Elect.
C336, C436	352744709	47μF, 16V, Elect.
C337, C338	352780339	3.3μF, 50V, Elect.
C339, C340	352780229	2.2μF, 50V, Elect.
C343	352780229	2.2μF, 50V, Elect.
C344, C345	352780339	3.3μF, 50V, Elect.
C346, C446	352780229	2.2μF, 50V, Elect.
C348, C448	352780229	2.2μF, 50V, Elect.
C349	352784799	0.47μF, 50V, Elect.

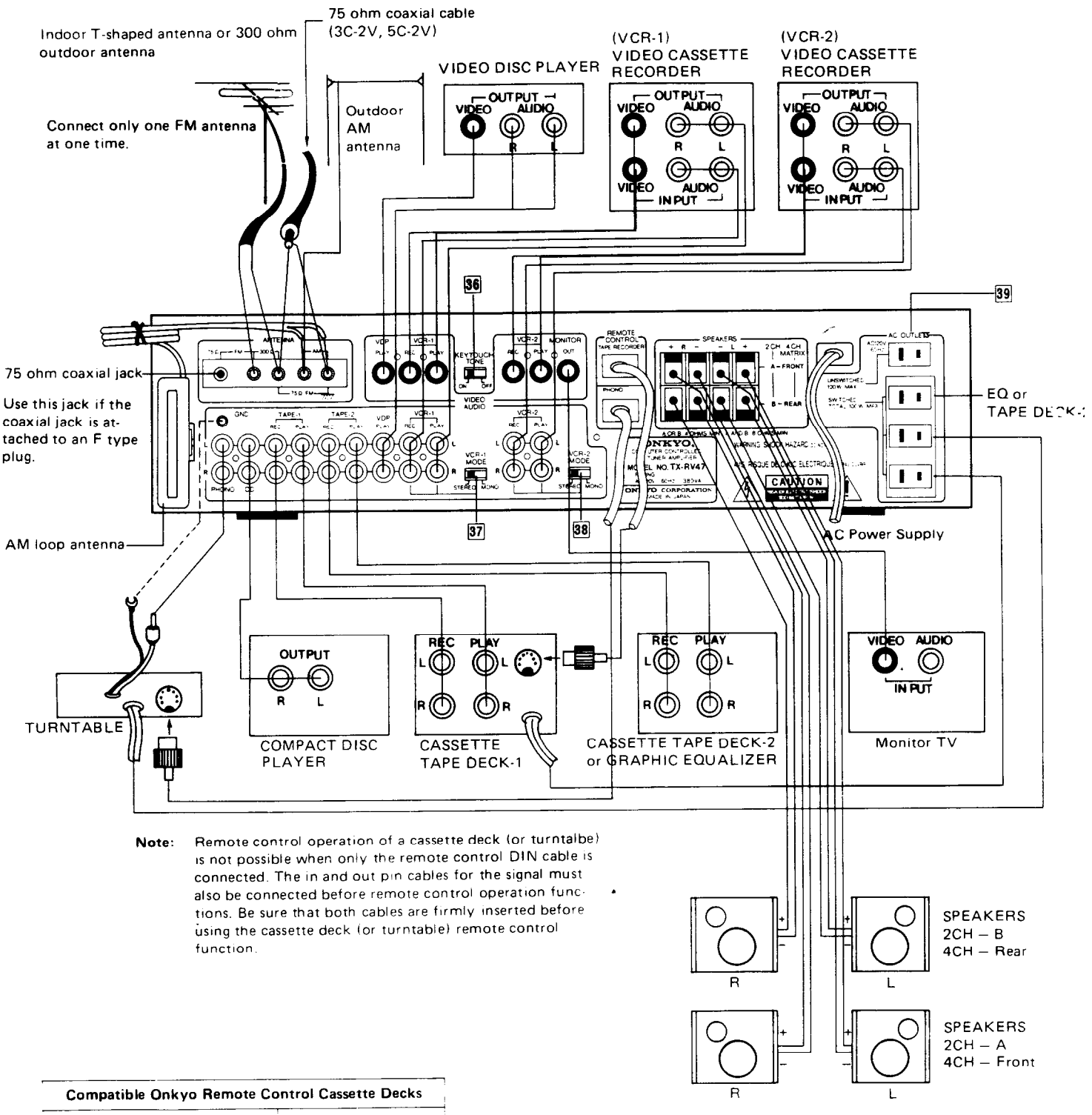
CIRCUIT NO.	PARTS NO.	DESCRIPTION
C501, C601	352750479	4.7μF, 25V, Elect.
C504, C604	3500080	100μF, 10V, Elect.
C506, C606	352774709	47μF, 63V, Elect.
C508-C511	352780159	1.5μF, 50V, Elect.
C608-C611	352780159	1.5μF, 50V, Elect.
C513, C514	352782219	220μF, 50V, Elect.
C515, C516	352781009	10μF, 50V, Elect.
C616	352781009	10μF, 50V, Elect.
C852	352722219	220μF, 6.3V, Elect.
C854	352784799	0.47μF, 50V, Elect.
C855	352742219	220μF, 16V, Elect.
C857	352732209	22μF, 10V, Elect.
C871, C881	352751019	100μF, 25V, Elect.
C904, C905	3504178	10,000μF, 50V, Elect
C906, C907	352761019	100μF, 35V, Elect.
C910, C911	352744709	47μF, 16V, Elect.
C912, C913	352742219	220μF, 16V, Elect.
C915	352766809	68μF, 35V, Elect.
C916	352752229	2,200μF, 25V, Elect.
C917	352754709	47μF, 25V, Elect.
C918, C920	352741009	10μF, 16V, Elect.
C919	352751019	100μF, 25V, Elect.
	Resistors	
R506, R606	441523324	3.3kΩ, 1/2W, Metal oxide film
R507, R607		
R509, R609	441520474	4.7Ω, 1/2W, Metal oxide film
R511, R611	441521524	1.5kΩ, 1/2W, Metal oxide film
R512, R612	4000061	0.33Ω, 2W, Metal plate
R513, R613		
R516, R517	441521014	100Ω, 1/2W, Metal oxide film
R873	441529114	910Ω, 1/2W, Metal oxide film
R883	441527514	750Ω, 1/2W, Metal oxide film
R902, R903	441624714	470Ω, 1W, Metal oxide film
R906	441526824	6.8kΩ, 1/2W, Metal oxide film
R907	441520104	1Ω, 1/2W, Metal oxide film
R908	441621024	1kΩ, 1W, Metal oxide film
R909	441521004	10Ω, 1/2W, Metal oxide film
R910	441621004	10Ω, 1W, Metal oxide film
	Switches	
S301, S302	25065242	NSS-22104, Slide
S303-S305	25035499	NPS-242-162-L461, Push
	Relaies	
RL851	25065134	NRL-2P5A-DC24-07
RL871	25065247	NRL-2P1.25A-DC12-2 8
RL881	25065048	FRL-644D12/2AS
	Terminals	
P301-P303	25045171	NPJ-4PDBL-65
P304	25045166	NPJ-6PDBL-60
P305	25045171	NPJ-4PDBL-65
	Socket	
	25050268	NSCT-4P-96

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

DISPLAY CIRCUIT PC BOARD (NADIS-2474-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q721	222929	TC9185P
Q725	222931	μPC393C
	Transistors	
Q722-Q724	2211255,	2SC1815 (GR),
Q726, Q727	2210746 or	2SC945A (P) or
	2212485	JC501 (Q)
Q728-Q730	2212600 or	DTA124ES or
	221243	2SA1346
	Diodes	
D721, D722	223150,	US1040,
D725	223145 or	1S2076TD or
	223124	1S2473
D726, D727	223150 or	US1040 or
	223124	1S2473
D723, D724	223155	1SS138
	L. E. Ds	
D741-D744	225206C or	SEL2910D-C or
D748-D755	225206D	SEL2910D-D
D745-D747	225142	SEL2913K
D756-D771	225137CG,	SEL2413ECG,
	225137DG or	SEL2413EDG or
	225137DY	SEL2413EDY
	Capacitors	
C719	352722219	220μF, 6.3V, Elect.
C722	353744709	47μF, 16V, Elect.
C724	352741009	10μF, 16V, Elect.
	Switches	
S702-S729	25035389	NPS-111-S353, Push
	Socket	
	25050254	NSCT-3P82
	Spacers	
	27270172	LED 10
	27270173	LED 12
	Holder	
	27190415	LED R

SYSTEM CONNECTION DIAGRAM

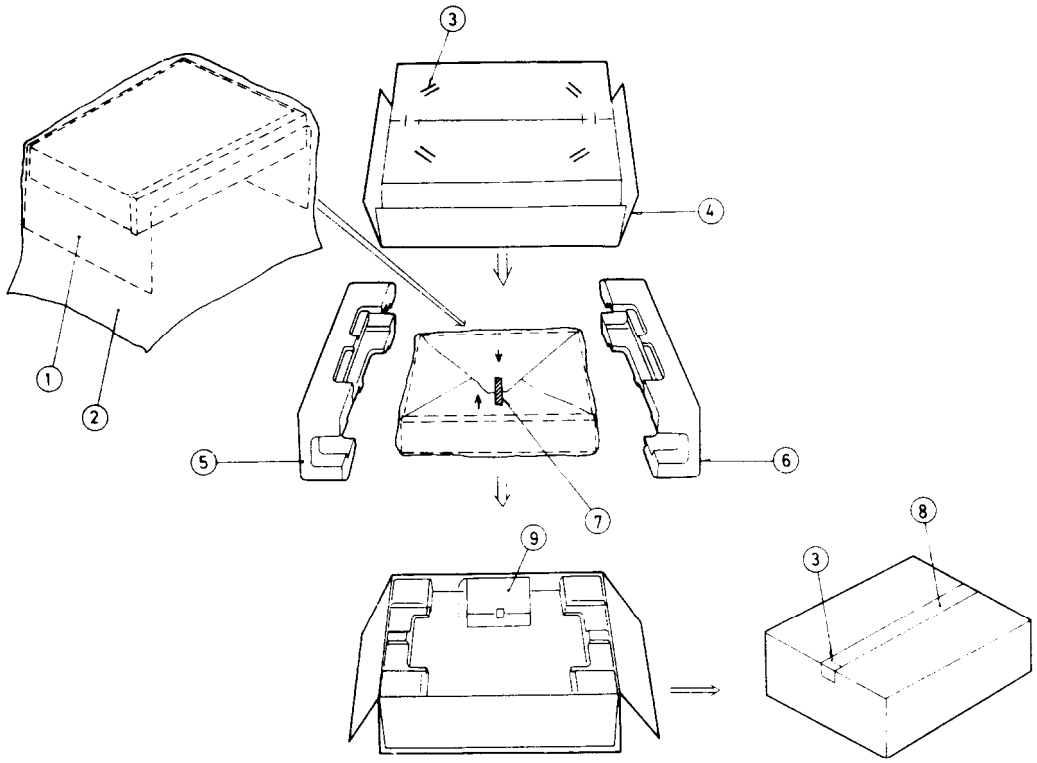


Note: Remote control operation of a cassette deck (or turntalbe) is not possible when only the remote control DIN cable is connected. The in and out pin cables for the signal must also be connected before remote control operation functions. Be sure that both cables are firmly inserted before using the cassette deck (or turntable) remote control function.

Compatible Onkyo Remote Control Cassette Decks	
TA-2047	TA-2036
TA-2090 (3-head)	TA-2044
TA-2056 (3-head)	TA-2033

Compatible Onkyo Remoce Control Turntables	
CP-1057F	CP-1044F
CP-1055F II	CP-1055F
CP-1046F	

PACKING VIEW



REF. NO.	PART NO.	DESCRIPTION
1	29095108-1	1000x600mm, Protection sheet
2	29100035A	1020x720mm, Poly-vinyl bag
3	282301	Sealing hook
4	29051226	Master carton box
5	29091046A	Pad R
6	29091045A	Pad L
7	261504	30x400mm, Adhesive tape
8	260012	50x700mm, Damplon tape
9	Accessary bag complete	
	29340953	Instruction manual
	292064A	FM antenna
	241059	Remote control unit
	3010054	UM-3, Two batteries
	29365006-7	Warranty card
	29358002C	Service station list
	29100006A	350x250, Poly-vinyl bag

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A510 printed in japan